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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TIM SIEVERS and ANDREAS LOHNER

Appeal 2008-2273
Application 10/719,585
Technology Center 1700

Decided: August 6, 2008

Before BRADLEY R. GARRIS, THOMAS A. WALTZ, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

WALTZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Primary Examiner's final rejection of claims 1-5, 7, and 8, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

According to Appellants, the invention is directed to a method for the production of a work piece by the successive compacting, by means of

electromagnetic radiation or particle radiation, of powdered starting material that has been applied horizontally in layers, with mechanical finishing subsequent to compacting of at least one of the two vertical side walls of the trace while the work piece is surrounded by the powdered starting material. Independent claim 1 is illustrative of the invention and a copy of this claim is reproduced below:

1. A method for the production of a work piece by the successive compacting, by means of electromagnetic radiation or particle radiation, of powdered starting material that has been applied horizontally in layers, so that each layer consisting of at least one trace comprises two substantially vertical lateral faces and one substantially horizontal upper face which, in turn, forms the basis for a possible subsequent layer, wherein at least one of the two vertical side walls is subject to mechanical finishing subsequent to the compacting of said powdered starting material that has been applied horizontally in layers, and wherein the work piece to be formed is surrounded by said powdered starting material during its production and during the mechanical finishing, wherein the mechanical finishing of the vertical side wall of an n^{th} layer is performed after the generation of an $n+x^{\text{th}}$ layer only and wherein mechanical finishing of the $n+x^{\text{th}}$ layer is not performed at the same time as mechanical finishing of the n^{th} layer.

The Examiner has relied on the following prior art references as evidence of obviousness:

Prinz	US 5,207,371	May 4, 1993
Benda	US 5,427,733	Jun. 27, 1995
Celiker	DE 195 33 960 A1	Mar. 20, 1997
(hereafter "Herfurth," as translated) ¹		

¹ As explained by the Examiner (Ans. 3), Celiker is the first-named inventor of DE 195 33 960 but this publication was mistakenly referred to as "Herfurth" during prosecution. Since both Appellants (App. Br. 4) and the Examiner refer to Celiker as "Herfurth," we adopt this terminology throughout our decision.

ISSUES ON APPEAL

Claims 1, 2, 4, 5, 7, and 8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Benda in view of Herfurth (Ans. 3).

Claim 3 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Benda in view of Herfurth and Prinz (Ans. 6).

Appellants contend that none of the cited prior art teaches the requirement found in all claims that each layer be mechanically finished while the layer is still surrounded with powdered starting material (App. Br. 5). Appellants further contend that this requirement can not be shown by Benda since the Examiner agrees that Benda is silent as to mechanical finishing (App. Br. 6).

Appellants contend that Herfurth “clearly and repeatedly” teaches that powder that was not used should be removed between layers (App. Br. 6). Appellants further contend that, although the feature of blowing or vacuuming of powder is only recited in a dependent claim, only embodiments comprising means for blowing and vacuuming of powder are provided in Herfurth (Reply Br. 2).

Appellants also contend that it is evident from Fig. 1 of Herfurth that excess powder will not accumulate around the work piece but will be dispersed over the cooling plate (Reply Br. 3).

The Examiner contends there is no teaching in Benda that one should remove the excess powder between the layers of the work piece, and it would have been obvious to one of ordinary skill in the art to allow the powder to remain in place to avoid the time and expense of removing the powder (Ans. 4).

The Examiner contends that one of ordinary skill in the art would not have incorporated all aspects of the Herfurth process into the Benda process, and the use of a vacuum in Herfurth is merely one preferred embodiment (Ans. 7-8).

Accordingly, we determine the following issue is presented from the record in this appeal: have Appellants established that the Examiner reversibly erred in determining that the teachings of Herfurth would have been combined with the disclosure of Benda by one of ordinary skill in the art to render the claimed subject matter obvious?

We determine that the Examiner has properly established a prima facie case of obviousness in view of the reference evidence, which prima facie case has not been adequately rebutted by Appellants' arguments. Therefore, we AFFIRM all grounds of rejection presented for review in this appeal essentially for the reasons stated in the Answer, as well as those reasons set forth below.

OPINION

We determine the following Factual Findings (FF) from the record in this appeal:

- (1) Benda discloses a method for producing a work piece by the successive compacting of powdered starting material in horizontal layers by electromagnetic radiation, with each layer consisting of a horizontal surface and two substantially vertical lateral faces which form the basis for a possible subsequent layer (Ans. 3; Benda, Figs. 1 and 2; col. 1, ll. 45-57; col. 3, ll. 54-65; and col. 4, ll. 46-48);

- (2) Herfurth discloses a method for producing a work piece by the successive compacting of powdered starting material by use of a laser, while teaching the intermediate mechanical finishing of the n^{th} layer after generation of the $n+x^{th}$ layer, with the mechanical finishing of each layer not performed at the same time (Ans. 4; Herfurth 4:13-16; 8:12-14; 15:19-16:1; and Fig. 14); and
- (3) Herfurth teaches, in one preferred embodiment, that the unmelted powder is blown off and/or vacuumed away from the working region (Herfurth 5:6-7; 6:20-23; 11:22-25; 12:5-7; 19:29-30 (claim 19)).

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations, if any. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007). A prior art reference must be considered, under § 103, not only for what it expressly teaches but also for what it fairly suggests; all disclosures of the prior art, including unpreferred embodiments, must be considered in determining obviousness. *See In re Burckel*, 592 F.2d 1175, 1179 (CCPA 1979); *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976); and *In re Mills*, 470 F.2d 649, 651 (CCPA 1972).

Applying the preceding legal principles to the Factual Findings in the record of this appeal, we determine that the Examiner has properly established a *prima facie* case of obviousness, which *prima facie* case has not been adequately rebutted by Appellants' arguments. As shown by FF (1) listed above, and not disputed by Appellants (App. Br. 5-6), we determine that Benda discloses the claimed method for the production of a workpiece with the exception that Benda is silent with regard to the mechanical finishing aspect of the method. As shown by FF (2) listed above, we determine that Herfurth teaches mechanical finishing of work pieces produced in a similar method to that of Benda. Accordingly, we agree with the Examiner (Ans. 4 and 7) that it would have been *prima facie* obvious to one of ordinary skill in this art to apply the mechanical finishing technique taught by Herfurth to the work piece in the method of Benda to improve the work piece in the same way for the attendant benefits. *See KSR, supra.*

Appellants do not contest the combination of the mechanical finishing steps taught by Herfurth with the method disclosed by Benda (*see* the Briefs in their entirety). Appellants' principal argument is that Herfurth teaches vacuuming of the excess powder from the work piece region in contrast to claim 1, which requires that the "work piece to be formed is surrounded by said powdered starting material during its production" (App. Br. 6-8; Reply Br. 2-3). This argument is not persuasive for reasons stated in the Answer at page 8, namely that the blowing off and/or vacuuming taught by Herfurth is merely a *preferred* embodiment (*see* FF (3) listed above). We determine that one of ordinary skill in this art would have recognized only two possibilities or embodiments from the disclosure of Herfurth, i.e., vacuuming of the unmelted powder or leaving the excess powder around the

work piece. *See* independent claim 1 of Herfurth, with no limitation as to the unmelted powder, and dependent claim 19, which requires the unmelted powder to be blown off and/or vacuumed. Accordingly, we determine that it would have been well within the ordinary skill in this art to select either embodiment, depending on the cost and feasibility of adding a vacuum, vacuum opening, and vacuum frame to the milling device.²

Appellants argue that at no time will the work piece of Herfurth be surrounded by powdered starting material (Reply Br. 3, citing Fig. 1 of Herfurth). This argument is not persuasive since Appellants have not submitted any conclusive evidence that the excess powder in the process of Herfurth will be dispersed over the cooling plate by the “momentum” of the powder head and not surround or cover the work piece (Reply Br. 3). *See In re Scarborough*, 500 F.2d 560, 566 (CCPA 1974) (Attorney argument is generally held to be insufficient to take the place of evidence or expert testimony). In contrast, Herfurth teaches that excess powder “that was not melted in the melt region of the laser beam” will be vacuumed off (Herfurth 6:20-23). Herfurth defines the “working region” as the region “where the workpiece is being constructed layer by layer and where the powder is being melted” (Herfurth 11:22-24). Although, Herfurth teaches use of a vacuum frame to direct any excess powder back to the cooling plate for vacuuming, we determine that the disclosure of Herfurth suggests that the work piece is

² We note that Appellants state that they have invented a mechanical finishing tool having a configuration which allows it to produce acceptable results while milling through powder (App. Br. 7-8). We also note that Herfurth uses “very precise” milling or grinding tools in the same process (Herfurth 4:25-27 and 11:3-8). However, as correctly stated by the Examiner (Ans. 9), the claims on appeal do not require any particular tool or tool structure.

covered or “surrounded” by powdered starting material during the production of the work piece (Herfurth 11:26-34; Figs. 1 and 6).

For the foregoing reasons and those stated in the Answer, we sustain the rejection of claims 1, 2, 4, 5, 7, and 8 under § 103(a) over Benda in view of Herfurth. Appellants have not presented any specific argument against Prinz other than to state that Prinz does not cure the deficiency of Benda and Herfurth (App. Br. 10). Accordingly, we adopt the findings and conclusion of law regarding Prinz as stated by the Examiner (Ans. 6), and sustain the rejection of claim 3 for the reasons noted above. Therefore, the decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

PL initials:
sld

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